



Implementing Microsoft Windows 2000 with Service Pack 4 on ProLiant servers

integration note, 7th edition

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Abstract

This integration note provides information on installing, implementing, and troubleshooting Microsoft Windows 2000 Server and Windows 2000 Advanced Server on HP ProLiant servers for network administrators and field service engineers. It contains information on Windows 2000 implementations with Microsoft Service Pack 4 (SP4) applied.

It also includes information on the lifecycle status of the Windows 2000 product family at Microsoft and provides information about Windows 2000 Server availability and support on ProLiant servers from HP. Readers are introduced to Windows Server 2003 R2 as an alternative to Windows 2000.

This document provides information on supported hardware, step-by-step installation, features, and troubleshooting for Windows 2000 Server and Windows 2000 Advanced Server on HP ProLiant servers.

To obtain the latest information, visit:

http://h18004.www1.hp.com/products/servers/software/microsoft/OS/Windows2000_index.html.

Introduction

The development of a new operating system requires an extraordinary relationship between the developer and hardware supplier. As a Joint Development Partner for Microsoft Windows 2000, HP engineered and tested its hardware and support software on this revolutionary network operating system from its inception. In fact, the majority of Windows 2000 code was developed on HP products, and all deployment program events were run on industry-standard servers.

In developing implementation information for the initial release of this document, we used the ProLiant Essentials Foundation Pack software listed below.

- SmartStart Release 6.30 and 6.40
- Management CD Release 6.30 and 6.40
- ProLiant Support Pack (PSP) for Microsoft Windows 2000 Version 6.30A and 6.40A

As of the publication date, the latest releases supporting Windows 2000 include:

- ProLiant Essentials Foundation Pack 7.60
- ProLiant Support Pack (PSP) for Microsoft Windows 2000 Version 7.60A

The SmartStart CD ships standard with most HP ProLiant servers. For more information, visit

www.hp.com/servers/smartstart.

HP Systems Insight Manager and the PSP can be downloaded at www.hp.com/cgi-bin/hpsupport/index.pl.

Planning considerations

When implementing a server operating system release, careful planning makes the difference between success and failure. Take time with each step of the process to make sure you cover all the bases. First, understand the current network configuration including an examination of the structure, domains, security needs, and Internet usage. Then, verify that the current applications can operate in a Microsoft Windows 2000 environment or if an upgrade or replacement must be found.

Consider that in June 2005, Microsoft transitioned the Windows 2000 product family from Mainstream Support to Extended Support (the last 5 years in its lifecycle). Microsoft released the last service pack, Service Pack 4, for Windows 2000 Server in July 2003, followed by a Windows 2000 Server service pack Update Rollup Pack in September 2005, and continues to support Windows 2000 with security hot fixes and paid support but no longer provides complimentary support options,

design changes requests, and non-security hotfixes. The Windows 2000 family entered the marketplace in February 2000 and remains a robust, mature product.

While HP continues to support Windows 2000 Server family on HP ProLiant servers that were announced before June 30, 2006, HP no longer sells the Windows 2000 product. Contact a Microsoft reseller for product information. Implementation strategy should include checking www.hp.com/go/microsoft for new information on a regular basis. HP Services can help in planning a Windows implementation; check their website, www.hp.com/hps/os/os_windows.html.

Finally, evaluate the hardware to determine which hardware migrates, which upgrades, and which must be replaced. Establish functional teams with experts in directory services, administration and management, core OS, networking, applications, and hardware compatibility. Have these teams evaluate Windows 2000, its successor Windows Server 2003 R2, and the hardware. Take the time to correctly plan the implementation. Make clear assignments and verify progress along the way.

Windows Server 2003 is a comprehensive, integrated and secure server operating system designed to help customers reduce costs and increase the efficiency and effectiveness of IT operations. Building on Windows 2000 family strengths, this server platform helps customers extend existing resources while laying the foundation for building a generation of connected applications that improve business productivity.

Windows Server 2003 R2 provides customers with significant security enhancements as well as reliability and performance improvements. Building on a comprehensive collection of security updates, Service Pack 1 addresses additional core security issues by providing customers with a reduced attack surface, better protected system services with stronger default settings, and reduced privileges. Windows Server 2003 R2 not only includes Windows Server Service Pack 1 (SP1) but also OS updates and additional OS features beyond what was delivered in SP1.

Installation considerations

Microsoft ships Windows 2000 Server and Windows 2000 Advanced Server with and without Windows 2000 Service Pack 4 (SP4). SP4 contains a comprehensively tested collection of updates that addresses customer-reported concerns with the Windows 2000 operating system. SP4 enhances the overall reliability of Windows 2000 and features easier and more robust mechanisms for applying Service Packs to Windows 2000.

Options include installing the Windows 2000 server operating system with integrated SP4 or upgrading to SP4 from either a new or existing system. Before installing the integrated version of Windows 2000, make certain that software applications support SP4.

IMPORTANT

If the integrated version of Windows 2000 and SP4 is installed, it cannot be uninstalled SP4.

Our testing for this document used SmartStart Releases 6.30 and 6.40, Management CD Releases 6.30 and 6.40, and PSP for Windows 2000 Versions 6.30A and 6.40A. These releases, and later releases, support Microsoft Windows 2000 Server and Windows 2000 Advanced Server as well as Service Pack 4.

Upgrade/migration considerations

Since many customers implement Microsoft Windows 2000 in stages, some hardware may require a new installation while upgrading or migrating older hardware to Windows 2000.

Supported server platforms

Microsoft Windows 2000 Server and Windows 2000 Advanced Server are supported on the HP ProLiant and Prosignia servers listed in Table 1.

Table 1 also lists the latest ROMPaq version for the HP ProLiant server family at the time of this publication and Prosignia platforms supported during the initial release of Windows 2000. For the latest ROM information, visit www.hp.com/cgi-bin/hpsupport/index.pl.

Table 1. Supported system platforms for Windows 2000

Server platform	ROM family	ROM date (minimum)
Prosignia Server 720	D01/F01	04/19/2000
Prosignia Server 740	S01	11/08/2000
ProLiant 400	D01/F01	04/19/2000
ProLiant 800	P02	04/19/2000
	P14 and P18	11/08/2000
ProLiant 850R	P04	04/19/2000
ProLiant 1200	E35	04/19/2000
ProLiant 1600	E34	04/19/2000
	P08	11/08/2000
ProLiant 1850R	P07	02/14/2002
ProLiant 2500	E24	12/01/1999
	E50	06/28/1999
ProLiant 3000	P09	11/08/2000
	E39	04/19/2000
ProLiant 5000	E16	04/30/1999
ProLiant 5500	E39	04/19/2000
ProLiant 5500 Xeon	P12	11/08/2000
ProLiant 6000	E20	04/30/1999
ProLiant 6000 Xeon	P40	12/27/1999
	P43	12/27/1999
ProLiant 6400R	P11	11/08/2000
ProLiant 6500	E25	04/30/1999
ProLiant 6500 Xeon	P11	11/08/2000
ProLiant 7000	E40	04/30/1999
ProLiant 8000	P41	05/05/2003
ProLiant 8500	P42	05/05/2003
ProLiant BL10e	I03	12/17/2003

Server platform	ROM family	ROM date (minimum)
ProLiant BL10e G2	I07	08/05/2005
ProLiant BL20p	I01	05/01/2004
ProLiant BL20p G2 (2.8 GHz+)	I04	09/16/2004
ProLiant BL20p G3	I08	02/14/2006
ProLiant BL20p G4	I13	06/14/2006
ProLiant BL25p	A02	08/31/2005
ProLiant BL30p	I10	06/01/2005
ProLiant BL35p	A03	03/01/2006
ProLiant BL40p	I02	09/15/2004
ProLiant BL45p	A02	08/31/2005
ProLiant 460c	I15	09/18/2006
ProLiant CL1850	P07	02/14/2002
ProLiant CL380	P17	12/18/2002
ProLiant DL140	DL140	05/05/2006
ProLiant DL140 G2	O04	03/31/2006
ProLiant DL140 G3	O08	10/04/2006
ProLiant DL145	O01	07/21/2005
ProLiant DL145 G2	O05	03/23/2006
ProLiant DL320	D05/F05	11/15/2002
ProLiant DL320 G2	D13	09/05/2004
ProLiant DL320 G3	D18	08/16/2005
ProLiant DL320 G4	D20	06/30/2006
ProLiant DL360	P21	11/15/2002
HP ProLiant DL360 G2	P26	05/01/2004
ProLiant DL360 G3	P31	09/15/2004
ProLiant DL360 G4	P52	02/14/2006

Server platform	ROM family	ROM date (minimum)
ProLiant DL360 G4p	P54	02/14/2006
ProLiant DL360 G5	P58	09/18/2006
ProLiant DL380	P17	02/18/2003
ProLiant DL380 G2	P24	05/01/2004
ProLiant DL380 G3	P29	09/15/2004
ProLiant DL380 G4	P51	04/24/2006
ProLiant DL380 G5	P56	09/18/2006
ProLiant DL385	A05	03/01/2006
ProLiant DL560	P30	09/15/2005
ProLiant DL580	P20	02/17/2002
ProLiant DL580 G2	P27	09/15/2004
ProLiant DL580 G3	P38	08/08/2006
ProLiant DL580 G4	P59	09/08/2006
ProLiant DL585	A01	03/22/2006
ProLiant DL740	P47	09/15/2004
ProLiant DL760	P46	05/05/2003
ProLiant DL760 G2	P44	09/15/2004
ProLiant ML110 G2	O03	12/08/2005
ProLiant ML110 G3	O06	08/17/2006
ProLiant ML150 G2	O02	06/30/2006
ProLiant ML150 G3	O07	08/29/2006
ProLiant ML310	D12	09/15/2004
ProLiant ML310 G2	W01	01/20/2006
ProLiant ML310 G3	W02	08/07/2006
ProLiant ML330	D03/F03	11/15/2002
ProLiant ML330e	D06	11/15/2002
ProLiant ML330 G2	D10	11/01/2003

Server platform	ROM family	ROM date (minimum)
ProLiant ML330 G3	D15	10/11/05
ProLiant ML350	D02/F02	05/30/2003
	D04/F04	11/15/2002
ProLiant ML350 G2	D11	11/01/2003
ProLiant ML350 G3	D14	09/15/2004
ProLiant ML350 G4	D17	02/15/2006
ProLiant ML350 G4p	D19	02/15/2006
ProLiant ML350 G5	D21	09/27/2006
ProLiant ML370	P17	12/18/2002
ProLiant ML370 G2	P25	05/01/2004
ProLiant ML370 G3	P28	09/15/2004
ProLiant ML370 G4	P50	02/14/2006
ProLiant ML530	P19	12/18/2003
ProLiant ML530 G2	P22	09/15/2004
ProLiant ML570	P20	2/17/2003
ProLiant ML570 G2	P32	04/26/2005
ProLiant ML570 G3	P37	08/08/2006
ProLiant ML570 G4	P60	08/09/2006
ProLiant ML750	P45	06/12/03

Many of these devices have firmware upgrades available through the Options ROMPaq. The latest version of the Options ROMPaq is on the HP website at www.hp.com/cgi-bin/hpsupport/index.pl.

Supported software

Table 2 below lists supported utilities and the minimum version needed for Microsoft Windows 2000.

Table 2. Supported utilities for Windows 2000

Utility	Minimum Version	Location
Array Configuration Utility	2.90.65.0	www.hp.com/cgi-bin/hpsupport/index.pl
HP Systems Insight Manager	5.0	www.hp.com/go/hpsim
Server Diagnostics	S11.01 A	www.hp.com/cgi-bin/hpsupport/index.pl
System Configuration Utility	2.58A	www.hp.com/cgi-bin/hpsupport/index.pl
Survey Utility	2.42.26.0	www.hp.com/cgi-bin/hpsupport/index.pl
Remote Monitor Service	5.0.2.0	PSP 6.30A
Integrated Management Display Utility	5.0.2.0	PSP 6.30A
Enhanced Integrated Management Display Service	5.0.2.0	PSP 6.30A
Integrated Management Log Viewer	5.0.5.0	PSP 6.30A
Power Supply Viewer	5.0.2.0	PSP 6.30A
Power Down Manager	5.0.2.0	PSP 6.30A
Array Redundancy Software	5.0.2.0	PSP 6.30A
Rack Infrastructure Interface Service	1.6.2195.0	PSP 6.30A
Legacy Port Configuration Component	1.5.2195.3	PSP 6.30A
Remote Insight Diskette Image Utility	1.00 A	www.hp.com/cgi-bin/hpsupport/index.pl

Utility	Minimum Version	Location
Remote Insight Lights-Out Edition Group Administration Utility	1.21 A	www.hp.com/cgi-bin/hpsupport/index.pl
Version Control Repository Manager -- Promotional Version	1.0.1288.1	www.hp.com/cgi-bin/hpsupport/index.pl

Supported management options and agents

Table 3 lists supported management options and driver revisions needed to interface with Microsoft Windows 2000.

Table 3. Supported management options for Windows 2000

Option	Driver	Location
Integrated System Management Controller Driver	CPQCSM.SYS, SYSMGMT.SYS	PSP 6.30A
System Management Controller Driver	CPQSS.SYS, SYSMGMT.SYS	PSP 6.30A
Remote Insight Board Driver	CPQRIB.SYS	PSP 6.30A
Remote Insight Lights-Out II Board Driver	CPQRIB2.SYS	PSP 6.30A
iLO Advanced System Management Controller Driver	CPQASM2.SYS, SYSMGMT.SYS	PSP 6.30A
Advanced System Management Controller Driver	CPQASM.SYS, SYSMGMT.SYS	PSP 6.30A
Integrated Lights-Out Management Interface Driver	CPQCIDRV.SYS	PSP 6.30A
Integrated System Management Controller Driver	CPQCSM.SYS, SYSMGMT.SYS	PSP 6.30A

Table 4 lists supported management agents provided with Microsoft Windows 2000.

Table 4. Supported agents for Windows 2000

Agent	Version	Location
Foundation agent	6.20.0.0	HP Support & drivers website: www.hp.com/cgi-bin/hpsupport/index.pl
Storage agent	6.20.0.0	
NIC agent	6.20.0.0	
Server agent	6.20.0.0	
Version control agent	1.0.3085.0	

Supported storage options

Table 5 below lists supported storage options and driver revisions needed to interface with Windows 2000.

Table 5. Supported storage options for Windows 2000

Option	Driver	Location
4.3 – 36-GB Hard Disk Drives	N/A	No driver required
4/8-GB SLR Tape Drive	TANDQIC.SYS	Included on Windows 2000 CD
4x-32x CD-ROM Drives		Included on Windows 2000 CD
DDS2 4/16-GB Autoloader		Included on Windows 2000 CD
DDS3 12/24-GB DAT Autoloader		Included on Windows 2000 CD
DAT Tape Drives		Included on Windows 2000 CD
DLT Autoloader M35/70		Included on Windows 2000 CD
DLT Library 7000		Included on Windows 2000 CD
DLT Tape Array		Included on Windows 2000 CD
StorageWorks DLT 8000 Tape Drive	DLTTAPE.SYS	Included on Windows 2000 CD
Fibre Channel Host Controller /E	CPQFCALM.SYS	PSP 6.30A
Fibre Channel Host Controller /P	CPQFCALM.SYS	PSP 6.30A

Option	Driver	Location
Fibre Channel Filter Driver	CPQFCFTR.SYS	PSP 6.30A
Fibre Channel Array	CPQFCAC.SYS	PSP 6.30A
Smart Array 4200, Smart Array 4250ES, and Integrated Smart Array Controllers	CPQARRAY2.SYS	PSP 6.30A
SMART SCSI, SMART-2, Smart Array 221 RAID, Smart Array 3100ES RAID and SMART Array 3200 RAID Controllers	CPQARRAY.SYS	PSP 6.30A; see Notes 2 and 3
32-bit Fast-Wide SCSI-2 Controller /E	CPQ32FS2.SYS	CPQFWS2E driver included on Windows 2000 CD
32-bit Fast-Wide SCSI-2 Controller /P	CPQ32FS2.SYS	PSP 6.30A; Symbios driver included on Windows 2000 CD
64-bit Fast Ultra-2 SCSI Controller	CPQ32FS2.SYS	PSP 6.30A; Symbios driver included on Windows 2000 CD
Dual Channel Wide-Ultra SCSI-3 Controller	CPQ32FS2.SYS	PSP 6.30A, Symbios driver included on Windows 2000 CD
Wide-Ultra SCSI-2 Controller	CPQ32FS2.SYS	PSP 6.30A; Symbios driver included on Windows 2000 CD
CMD 0649 IDE Ultra DMA Controller Driver	CMDIDE.SYS	PSP 6.30A
64-Bit/66-Mhz Dual Channel Wide Ultra3 SCSI Controller Driver	ADPU160M.SYS	PSP 6.30A
HP ProLiant Storage System Driver	PRINTSS.SYS	PSP 6.30A
Integrated Ultra ATA-100 Dual Channel Driver	MEGAIDE.SYS	PSP 6.30A
PCI Hot Plug Controller Driver	CPQPHP.SYS	PSP 6.30A
Smart Array E200, P400, and P600 Controller Driver	HPQCISSE2.SYS	PSP 7.60A
Smart Array 5x and 6x Controller Driver	CPQCISSM.SYS	PSP 6.30A
Smart Array 5x and 6x Notification Driver	CPQCISSE.SYS	PSP 6.30A
Drive Array Notification	CPQDAEN.SYS	PSP 6.30A

Option	Driver	Location
<p>NOTE 1: Many of these devices have firmware upgrades available through the Options ROMPaq. The latest version of the Options ROMPaq can be downloaded from www.hp.com/cgi-bin/hpsupport/index.pl.</p> <p>NOTE 2: CPQARRAY.SYS is included on the Windows 2000 CD. After installing Windows 2000, update the driver with the CPQARRAY.SYS included on SP10633 to ensure the highest level of service and reliability.</p> <p>NOTE 3: A special version of CPQARRAY.SYS is necessary for PCI Hot Plug functionality.</p>		

Supported network interface controllers (NICs)

Table 6 lists supported NICs, including the driver revisions needed to interface with Windows 2000.

Table 6. Supported HP NICs for Windows 2000

NIC	Driver	Location
NC1020:		
for x86 systems	Q57XP32.SYS	PSP 6.30A
for x 64 systems	Q57AMD64.SYS	PSP 6.30A
NC150T:		
for x86 systems	Q57XP32.SYS	PSP 6.30A
for x 64 systems	Q57AMD64.SYS	PSP 6.30A
NC310:		
for x86 systems	N1000325.SYS	PSP 6.30A
for x 64 systems	N1G5132E.SYS S	PSP 6.30A
NC325M:		
for x86 systems	N1000325.SYS	PSP 6.30A
for x 64 systems	N1000325.SYS	PSP 6.30A
NC340T:		
for x86 systems	N1000325.SYS	PSP 6.30A
for x 64 systems	N1000325.SYS	PSP 6.30A
NC360T		
for x86 systems	N1E5132.SYS	PSP 6.30A
for x 64 systems	N1E5132E.SYS	PSP 6.30A
NC370T/F/i:		
for x86 systems	BXVBDX.SYS	PSP 6.30A
for x 64 systems	BXVBDX.SYS	PSP 6.30A
NC371i:		
for x86 systems	BXVBDX.SYS	PSP 6.30A
for x 64 systems	BXVBDX.SYS	PSP 6.30A

NIC	Driver	Location
NC373T/F/M/i::		
for x86 systems	BXVBDX.SYS	PSP 6.30A
for x 64 systems	BXVBDX.SYS	PSP 6.30A
NC374M:		
for x86 systems	BXVBDX.SYS	PSP 6.30A
for x 64 systems	BXVBDX.SYS	PSP 6.30A
NC380T:		
for x86 systems	BXVBDX.SYS	PSP 6.30A
for x 64 systems	BXVBDX.SYS	PSP 6.30A
NC6170:		
for x86 systems	N1000325.SYS	PSP 6.30A
for x 64 systems	N1G5132E.SYS	PSP 6.30A
NC7170::		
for x86 systems	N1000325.SYS	PSP 6.30A
for x 64 systems	N1G5132E.SYS	PSP 6.30A
NC7761:		
for x86 systems	Q57XP32.SYS	PSP 6.30A
for x 64 systems	Q57AMD64.SYS	PSP 6.30A
NC7761:		
for x86 systems	Q57XP32.SYS	PSP 6.30A
for x 64 systems	Q57AMD64.SYS	PSP 6.30A
NC7771:		
for x86 systems	N1000325.SYS	PSP 6.30A
for x 64 systems	N1G5132E.SYS	PSP 6.30A
NC7781:		
PCI-X LOM for		PSP 6.30A
32-bit systems	Q57XP32.SYS	PSP 6.30A
for x 64 systems	Q57AMD64.SYS	
NC7782 PCI-X:		
for x86 systems	Q57XP32.SYS	PSP 6.30A
for x 64 systems	Q57AMD64.SYS	PSP 6.30A
HP 100 FDDI PCI DAS Fiber-SC Controller	SKFPWIN.SYS	Included on Windows 2000 CD
HP 100 FDDI PCI SAS Fiber-SC Controller	SKFPWIN.SYS	Included on Windows 2000 CD

NIC	Driver	Location
HP 100 FDDI PCI DAS UTP Controller	SKFPWIN.SYS	Included on Windows 2000 CD
HP 100 FDDI PCI SAS UTP Controller	SKFPWIN.SYS	Included on Windows 2000 CD
HP 100 FDDI PCI SAS Fiber-MIC Controller	SKFPWIN.SYS	Included on Windows 2000 CD
HP 32-Bit DualSpeed Token Ring Controller	NETFLX.SYS	Included on Windows 2000 CD
HP NC1120 Ethernet NIC	N100NT5.SYS	Included on Windows 2000 CD
HP HP ProLiant NC31xx Fast Ethernet NICs	N100NT5.SYS	PSP 6.30A
HP NC4621 Token Ring NIC	CPQTRND5.SYS	Included on Windows 2000 CD
HP NC61xx/NC71xx Gigabit Ethernet NICs	N1000NT5.SYS	PSP 6.30A
HP NC67xx/NC77xx Gigabit Ethernet NICs	Q57W2K.SYS	PSP 6.30A
HP Network Teaming and Configuration	CPQDGD.SYS, CPQGBDD.SYS, CPQKDDP.SYS, FAD.SYS	PSP 6.30A
IBM 16/4 TOKEN RING PCI SPECIAL	IBMTRP.SYS	Included on Windows 2000 CD
NetFlex/NetFlex-2 ENET/TR Controller	NETFLX.SYS	Included on Windows 2000 CD
NetFlex-2 DualPort ENET Controller	NETFLX.SYS	Included on Windows 2000 CD
NetFlex-2 DualPort TR Controller	NETFLX.SYS	Included on Windows 2000 CD
NetFlex-2 TR Controller	NETFLX.SYS	Included on Windows 2000 CD
NetFlex-3/E	NETFLX3.SYS	PSP 6.30A
NetFlex-3/P	NETFLX3.SYS	PSP 6.30A
NetFlex-3 Embedded	NETFLX3.SYS	PSP 6.30A
Netelligent 4/16 TR PCI UTP/STP Controller	CPQTRND4.SYS	Included on Windows 2000 CD
Netelligent 10/100 TX Embedded UTP	NETFLX3.SYS	PSP 6.30A

NIC	Driver	Location
Netelligent 10/100 TX Embedded UTP/AUI	NETFLX3.SYS	PSP 6.30A
Netelligent 10/100TX PCI UTP Controller	NETFLX3.SYS	PSP 6.30A
Netelligent 10 TX PCI UTP Controller	NETFLX3.SYS	PSP 6.30A
Netelligent 10/100 TX	NETFLX3.SYS	PSP 6.30A
Netelligent 10/100 TX WOL PCI UTP - Intel	N100NT5.SYS	Included on Windows 2000 CD
Netelligent 10 T/2 PCI UTP Coax Controller	NETFLX3.SYS	PSP 6.30A
Netelligent 10 T/2 TX Embedded UTP/Coax	NETFLX3.SYS	PSP 6.30A
Netelligent 16/4 PCI IBM UTP/STP Controller	IBMTRP.SYS	Included on Windows 2000 CD
Netelligent Dual 10/100TX PCI UTP Controller	NETFLX3.SYS	PSP 6.30A

NOTE: NETFLX3.SYS is available on the Windows 2000 CD. However, after installing Windows 2000, update the driver to the version on SP10633 to ensure the highest level of service and reliability.

The latest ROMPaq versions support Microsoft Windows 2000 Server and Windows 2000 Advanced Server. Use the latest ROMPaq for server and options available through www.hp.com/cgi-bin/hpsupport/index.pl.

Visit the HP Support & drivers website to determine the ROM version and family of HP ProLiant and Prosignia server products: www.hp.com/cgi-bin/hpsupport/index.pl.

Support video

To interface properly with Windows 2000 Server, the HP ATI RAGE IIC Video Controller Driver (ATI2MPAH.SYS) included on PSP 6.40A (or later) must be loaded.

Hardware system requirements

The minimum requirements listed in this section pertain to the Microsoft Windows 2000 server operating system only, not to software applications running on system. Please check application requirements to make certain system can run both the operating system and software. Most software vendors have this information posted on their website.

NOTE

Windows 2000 Professional Edition is not supported for use on HP ProLiant and Prosignia servers.

To use Microsoft Windows 2000 Server, configuration must meet the requirements described in Table 7.

Table 7. Microsoft Windows 2000 Server configuration requirements

Feature	Minimum configuration	Recommended configuration
Processor (support for up to 4 processors)	133-MHz Pentium compatible	Pentium II or better 233 MHz or greater
RAM	128 MB	256 MB to 4 GB
Monitor	VGA	SVGA
Disk space	2 GB with minimum of 1 GB available	4 GB available space

To use Microsoft Windows 2000 Advanced Server, configuration must meet the requirements described in Table 8.

Table 8. Microsoft Windows 2000 Advanced Server configuration requirements

Feature	Minimum configuration	Recommended configuration
Processor (support for up to 8 processors)	133-MHz Pentium compatible	Pentium II or better 233 MHz or greater
RAM	128 MB	256 MB to 8 GB
Monitor	VGA	VGA
Disk space	2 GB with minimum of 1 GB available	4 GB available space

NOTE: Available disk space refers to free disk space on the partition to contain the system files. Additional space is required to copy the Windows 2000 CD contents to the hard disk during installation and for a network installation

Cluster configurations

The following cluster solutions are supported for use with Windows 2000 Advanced Server Service Pack 4:

- HP ProLiant DL380 G3 Packaged Cluster
- HP ProLiant DL380 G2 Packaged Cluster
- HP ProLiant Cluster HA/F100 & HA/F200 for MSA1000
- HP ProLiant Cluster HA/F500 for EVA5000 & EVA3000
- HP ProLiant Cluster HA/F500 for MA8000/EMA12000/EMA16000
- HP ProLiant Cluster HA/F100 & HA/F200 for RA4100
- HP ProLiant CL380 Packaged Cluster
- HP ProLiant CL1850 Packaged Cluster

Before installing the HP ProLiant Cluster solution, it is very important to refer to the HP Cluster Configuration Support website for details on components that make up a valid cluster configuration.

There is a support matrix for each HP Cluster that details components representing quality-tested and supported HP Cluster configurations.

Using the following website, select the appropriate operating system and storage platforms, and then refer to the row of deliverables that are relevant to the cluster configuration require. The HP Cluster Configuration Support website can be found at

<http://h18022.www1.hp.com/solutions/enterprise/highavailability/answercenter/configuration-all.html>.

System ROMs and option ROMs for Microsoft Windows 2000

The latest Windows 2000 compatible firmware for an HP ProLiant server can be located through the website at www.hp.com/cgi-bin/hpsupport/index.pl. This site provides special firmware upgrades for HP ProLiant servers and server options including both System and Option ROMPaqs. The latest SmartStart CD also contains ROMPaqs to take advantage of Windows 2000 enhancements.

Update the system according to the instructions included with the firmware before installing the operating system. To determine the correct ROM for the server, check the website at www.hp.com/cgi-bin/hpsupport/index.pl.

Server setup

Newer model HP ProLiant servers contain a ROM-Based Setup Utility (RBSU) embedded in the server ROM. RBSU takes the place of the System Configuration Utility (SCU) and to find supported features for a specific HP ProLiant server, refer to Appendix a.

Storage array configuration

The Option ROM Configuration for Arrays (ORCA) utility embedded in the server ROM configures the storage arrays for servers with the following controllers:

- Integrated Smart Array
- Smart Arrays 431, 4200, and 4250ES
- Smart Arrays 5i and 5i Plus
- Smart Array 532, 5302, 5304, and 5312
- Smart Array 641, 642, 6402, and 6404
- Smart Array E200, P400, and P600

Additional information is available at <http://h18000.www1.hp.com/products/servers/HPProLiantstorage/arraycontrollers/index.html>.

Additional components

Other components, such as storage and NICs, have been extensively deployed throughout the development and testing of Windows 2000. The Microsoft Windows 2000 CD contains many of the recommended drivers. However, some components benefit from the enhanced drivers available in the PSP, which resides on the HP software and drivers website at www.hp.com/cgi-bin/hpsupport/index.pl.

Installation of the PSP software after the installation of Microsoft Windows 2000 replaces the drivers installed from the Windows 2000 CD. If you install drivers after installing Service Pack 4 (SP4) and later uninstall SP4, you might have to reinstall the drivers. As with all Microsoft Service Pack uninstall procedures, registry changes can remove drivers or cause them to behave unpredictably.

Support software

The following software packages facilitate the installation, optimize system performance, and manage the Windows 2000 environment:

- Management agents
- Server Diagnostics
- PSP for Windows 2000

Prosignia and HP ProLiant systems sold prior to development of ROM-based setup tools (RBSU) use the following CD-based utilities to configure the server prior to OS installation:

- System Configuration Utility
- Array Configuration Utility

If you install Microsoft Windows 2000 to a separate partition on a server that has Windows NT 4.0 already installed to a partition, also obtain and install the latest PSP for Windows NT 4.0 and install it. The latest versions of this software for industry standard server are available through the following website, <http://h18023.www1.hp.com/support/files/server/us/SmartStartinfo630.html>.

Installation

This section provides detailed instructions for installing Microsoft Windows 2000 either as a fresh installation or as a dual-booting system on a server that currently has Windows NT 4.0 or Windows NT 3.51 installed.

Be aware that you cannot install Windows 2000 on the same partition as Windows NT and have a stable platform. Neither Windows NT nor Windows 2000 will operate correctly if both are installed in the same system partition.

To retain an existing Windows NT 4.0 (NTFS or FAT) or Windows NT 3.51 installation on a server, install Windows 2000 to a separate logical partition. Windows 2000 allows you to choose NTFS or FAT during the installation process. During the installation, Windows 2000 converts all NTFS partitions to NTFS5 partitions automatically. Windows NT 4.0 can read these partitions with the Microsoft Service Pack 4 or later installed; Windows NT 3.51 cannot read these partitions.

Before beginning

Make certain there is enough space to create a partition large enough to install Windows 2000, PSP for Windows 2000, and applications. If installed to a partition in a server operating under Windows NT 4.0, apply the latest Microsoft Service Pack for Windows NT 4.0. If this step is not included in the preparation, the Windows NT 4.0 partition might not be able to read the data after the installation of Windows 2000.

The Microsoft Service Pack is available through the Microsoft website at www.microsoft.com/ntserver/downloads/default.asp. Also, install the latest Support Software for Microsoft Windows NT available through the HP software and drivers website at www.hp.com/cgi-bin/hpsupport/index.pl.

Next, obtain the SmartStart CD or download the PSP for Windows 2000 from www.hp.com/cgi-bin/hpsupport/index.pl.

PSP for Windows 2000 replaces the Server Support diskettes for Windows NT (HP SSD for Windows NT). It requires more than 9.2 MB of disk space and does not create diskettes. Before beginning the Windows 2000 installation, copy the PSP files directly to the partition to be used for the installation.

For systems sold before the advent of ROM-based setup utilities (RBSU, ORCA), the following utilities are available as Support Software containing diskette image files:

- Array Configuration Utility (www.hp.com/cgi-bin/hpsupport/index.pl)
- System Configuration Utility (www.hp.com/cgi-bin/hpsupport/index.pl)

These utilities are not required for servers with RBSU/ORCA.

SmartStart configuration

If performing a fresh installation to an empty hard drive, HP recommends that using SmartStart to configure the server. SmartStart provides assisted, manual, and replicated installation approaches to setting up the pre-OS installation and installing the necessary software after the OS installation. SmartStart is provided in the HP ProLiant Essentials Foundation Pack included with every HP ProLiant server. Updates are available on the SmartStart website at www.hp.com/servers/smartstart.

The SmartStart Scripting Toolkit, also included in the HP ProLiant Essentials Foundation Pack, offers scripting tools for high volume server deployment and enables unattended automated installation. To learn more about this product and review its best practices guide, check the website at www.hp.com/servers/sstoolkit.

Included with every HP ProLiant BL10e server, and recommended for large numbers of HP ProLiant ML/DL servers, is the HP ProLiant Essentials Rapid Deployment Pack. Integrating the Altiris eXpress Deployment Server and the SmartStart Scripting Toolkit, the Rapid Deployment Pack provides a simplified point-and-click solution for deploying and maintaining standard server software configurations.

For additional information on this advanced deployment tool, visit www.hp.com/servers/rdp.

Installation steps

Complete the following steps to install Microsoft Windows 2000 on the server.

1. Prepare the pre-boot environment prior to booting the Windows 2000 OS. This involves the following steps:
 - a. Update the System and Option ROMs as necessary for the hardware.
 - b. Set up the system and boot partition if necessary.
 - c. Configure the storage arrays

Using SmartStart to facilitate all of these steps is highly recommended as is following the steps provided in the SmartStart documentation. In addition to providing a step-by-step approach to complete system software installation, SmartStart also intelligently guides the system setup based on the availability of ROM-based server setup and storage array configuration tools.

IMPORTANT

Existing NTFS partitions automatically upgrade to NTFS 5 partitions. Windows NT 3.51 systems on the same server cannot access NTFS 5 partitions; Windows NT 4.0 on the same server cannot read NTFS 5 partitions unless Microsoft Service Pack 4 or later has been installed.

2. Boot from the Microsoft Windows 2000 CD to install the operating system. The product key code and licensing information are also required. When prompted, create a new partition with at least 1 GB of free space. Detailed instructions for installing Windows 2000 can be found in the Help files on the Windows 2000 CD.

Help files for Windows 2000 Server Edition can also be found at <http://technet.microsoft.com/en-us/windowsserver/2000/default.aspx>. For Windows 2000

Advanced Server Edition, the Help files can be found at <http://technet.microsoft.com/en-us/windowsserver/2000/default.aspx>.

3. After the server operating system installation is completed, run SETUP.EXE to launch the PSP for Windows 2000. This installation utility analyzes the system configuration and installs all necessary HP device drivers. The PSP Deployment Utilities User Guide provides instructions on how to pre-configure and deploy smart components within the PSP.

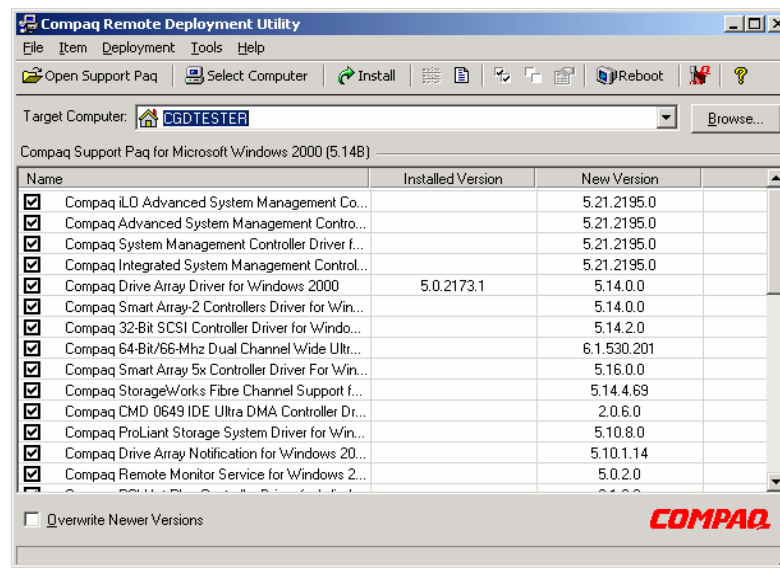
NOTE

Some devices produced by HP are hidden from Windows 2000 until the appropriate driver for the device is installed. To install drivers for hardware discovered after the Windows 2000 installation, use the manual installation option.

The opening screen lists all of the drivers, but only those drivers necessary for the system are installed. Readme and Help files are available with the software.

Figure 1 shows the opening screen for the PSP for Windows 2000.

Figure 1. Opening screen for the PSP for Windows 2000



4. Restart the server to complete the driver installation.
5. Install Microsoft Service Pack 4 by inserting the CD and selecting **Click Here to Install**.

Features

Several system tools and utilities transfer without change to Windows 2000. These tools and utilities now use the Installation Wizard screen. After the initial screen, most use the same GUI as seen in Windows NT including the Array Configuration Utility, Integrated Management Log Viewer, Power Down Manager, and Power Supply Viewer.

Some HP tools and utilities have changed in Windows 2000 and SP4. It may be necessary to reconfigure the Integrated Management Display Utility after installing Windows 2000, but the GUI

will be familiar. Other feature changes include HP Management Agents for Windows 2000, PCI Hot Plug implementation, NIC teaming, and mixed processor steppings.

Management agents

Management agents, by default, are installed with the PSP for Windows 2000. In Windows 2000, the default security setting for SNMP communities is READ ONLY. Because the Management agents require read-write access to the community, the default Windows 2000 security setting must be changed after the creation of the SNMP community.

When creating new SNMP communities, verify that community rights are set to READ WRITE. Verify that any SNMP communities already created (such as the default public community) are set to READ WRITE.

Foundation agents, NIC agents, server agents, and storage agents are all included in the PSP and on the SmartStart and Management CDs. The latest versions are also available on the HP website at www.hp.com/cgi-bin/hpsupport/index.pl.

After the agents installation has been completed successfully, use Insight Manager or Insight Manager 7 over a network connection to manage Windows 2000 servers. Insight Manager Console currently runs under Microsoft Windows 95, Microsoft Windows 98, Microsoft Windows NT 4.0, and Microsoft Windows 2000. Insight Manager 7 runs under Windows NT 4.0 and Windows 2000.

NOTE

Read the accompanying Help files available with the software, as they contain valuable information needed for proper installation.

Remote Insight Lights-Out Edition management

Remote Insight Lights-Out Edition (RILOE) may be used to deploy a "headless" server running Windows 2000 that does not require a monitor, keyboard, or a mouse. RILOE provides the ability for virtual presence and control to geographically dispersed servers.

IT managers can use the RILOE to perform most of the in-front-of-the-server operations remotely using a standard Web browser. The hardware-based virtual graphical console and virtual floppy can be used to install, configure, monitor, update, reboot, and troubleshoot HP ProLiant servers located in the data center or remote sites.

Integrated Lights-Out remote management

Integrated Lights-Out (iLO) is the next generation of Lights-Out technology integrated on the system board. The basic Lights-Out management features of iLO such as virtual power button, diagnostics, status, and logs are provided as standard components of the server, free of charge. The standard features of iLO are referred as iLO Standard.

Advanced functionality of the iLO, referred to as iLO Advanced, can be licensed with the optional HP ProLiant Essentials Integrated Lights-Out Advanced Pack. With the iLO Advanced Pack, the user has full functionality including virtual graphical console and virtual floppy. This functionality ships standard with RILOE. RILOE is not a supported option for iLO-based systems.

Using virtual floppy, the user can designate a virtual floppy image, power on the server, and complete a network-based installation. This technology can be used for deployment of Windows 2000 when integrated with the SmartStart Scripting Toolkit (boot floppy method) or any other network based installation. For more information on how to use RILOE or iLO or for information on purchasing the iLO Advanced Pack, go to www.hp.com/servers/ilo.

HP ProLiant servers offering iLO capability are listed in Appendix a and updated regularly at <http://h71028.www7.hp.com/enterprise/cache/461942-0-0-0-121.html>.

HP ProLiant Essentials Workload Management Pack

Developed exclusively for Windows 2000, HP ProLiant Essentials Workload Management Pack featuring Resource Partitioning Manager (RPM) increases the stability and availability of applications under Windows 2000 to allow customers to confidently deploy multiple applications on a single server. RPM builds upon the embedded job object technology in Windows 2000 to provide a quick and easy way to manage processor and memory resources dynamically.

For more information, please consult www.hp.com/servers/proliantessentials.

Advanced memory protection

Business dependency on industry-standard servers to run memory-intensive applications with Windows 2000 is pushing the memory capacity of servers to new levels. As server memory capacities increase, so does the likelihood of memory errors that can corrupt data and cause servers to crash. HP Advanced Memory Protection provides increased fault tolerance for applications that require higher levels of availability. HP ProLiant 300, 500, and 700 Series servers feature one or more Advanced Memory Protection technologies: Online Spare Memory, Hot Plug Mirrored Memory, and Hot Plug RAID Memory.

Online spare memory

Online Spare Memory is a spare bank of DIMMs for system memory failover. When a DIMM in system memory reaches a defined threshold of single-bit errors, the system will failover to the spare bank without intervention or server interruption. Online Spare Memory benefits customers with sites that cannot afford unscheduled downtime from memory errors, yet can wait until scheduled downtime to replace failed DIMMs.

Hot Plug mirrored memory

A redundant memory board mirrors system memory, which provides protection against correctable (single-bit) and previously uncorrectable (full 8-bit multi-bit error) memory errors. It also allows the user to hot plug suspect or failed memory without shutting down the server. Hot Plug Mirrored Memory is a more fault-tolerant option for sites that cannot afford downtime from memory errors and do not want to wait until scheduled downtime to replace failed DIMMs.

Hot Plug RAID memory

Much like with RAID disk technology, Hot-Plug RAID Memory provides the highest level of fault tolerance with a minimum of spare DIMMS. HP ProLiant servers offering Advanced Memory Protection are listed in Appendix a.

Wake on LAN (WOL)

A system that supports Wake on LAN can remain available to a systems administrator during its normal downtime. Once the machine is awakened, the systems administrator can remotely control, audit, debug or manage the machine. HP ProLiant servers supporting WOL (at time of publication) are listed in Appendix a.

Pre-boot eXecution environment (PXE)

PXE allows a new or existing system to boot over the network and download software, including Windows 2000, which is stored on a management or deployment server at another location on the network. PXE automates setting up and configuring new systems, enables decentralized software distribution, and remote troubleshooting and repairs.

PXE can be used to deploy Windows 2000 on any server.

HP ProLiant servers supporting PXE (at time of publication) are listed in Appendix a.

PCI Hot Plug

For Windows 2000, the implementation of PCI Hot Plug functionality enables hot adds, hot replace, and hot remove in all PCI Hot Plug-capable slots.

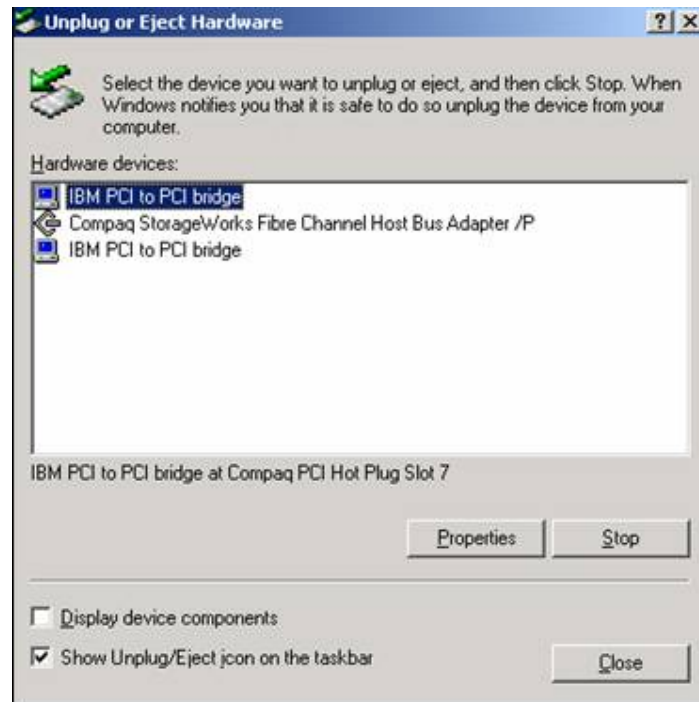
IMPORTANT

To properly implement PCI hot plug with Service Pack 4, use SmartStart Release 6.30 or SoftPaq13158. Download the SoftPaq from www.hp.com/cgi-bin/hpsupport/index.pl.

Power down the device before removing a device from a PCI Hot Plug slot. This can be done using the PCI Hot Plug Unplug/Eject icon, the Eject/Remove applet of Windows 2000, or the HP PCI Slot Server Request button on servers so equipped.

Figure 2 shows an example of the interface screen for PCI Hot Plug in Windows 2000.

Figure 2. PCI Hot Plug Unplug/Eject screen



HP Storage Agents Release 4.60 and later support the hot add and hot remove of storage controllers.

Teamed NICs

HP engineers developed a new driver to team NICs and better utilize them in a Windows 2000 Server environment. Following the installation, any broken NICs connections are displayed in the lower right-hand corner of the task bar as shown in Figure 3.

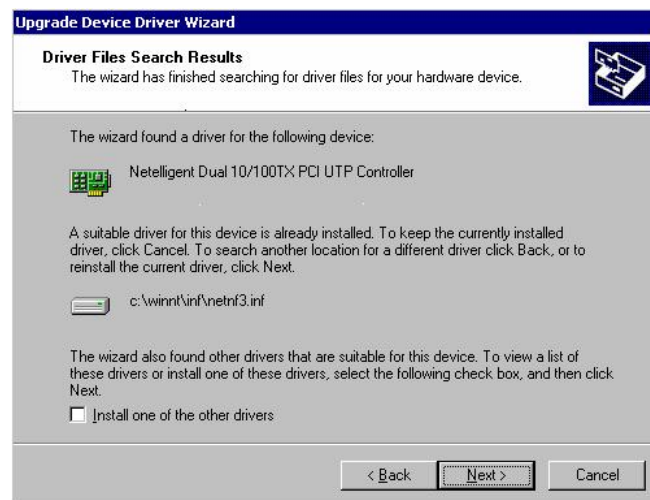
Figure 3. Task bar showing broken NIC connections



To resolve teaming issues:

1. Use Device Manager in Windows 2000 Server to update, load or modify NIC drivers installed on the server. When the screen in Figure 4 displays, check the box titled Install One of the Other Drivers.

Figure 4. Driver Files Search Results screen



2. Install the NIC teaming driver from PSP for Windows 2000 Version 5.16A or later by following the instructions provided with the Support Pack.
3. Figure 5 displays the PCI Hot Plug Unplug/Eject icon in the lower right-hand corner. Select the icon to add or remove any PCI Hot Plug devices.

Figure 5. PCI Hot Plug Unplug/Eject icon



Troubleshooting

This section provides information about issues discovered while testing Windows 2000 and SP4. It includes solutions for installation issues with options and drivers and implementation of many HP ProLiant value-add features. It also covers adding an EISA controller after the installation of Windows 2000 and the manual installation of the System Management Driver.

Installation issues and solutions for Windows 2000

This section provides information on installation-related topics to help successfully implement Windows 2000.

Table 9. Windows 2000 Server installation issues

Issue 1	Certain Smart Array controllers and associated storage devices are not visible in Smart Array Configuration Utility (ACU) and cannot be configured on HP ProLiant servers with Windows 2000 SP4 or SP3 Hotfix.
Description	<p>HP ProLiant servers configured with certain Smart Array Controllers and their associated storage devices will not be visible in the Array Configuration Utility (ACU) or in Insight Manager 7. The Smart Array Controllers and their associated storage devices will continue to function normally; however, they will not be able to be configured by the ACU. The Event Log will display "drivers not loading" messages and the Windows Device Manager will display warnings regarding the class drivers.</p> <p>This only occurs on HP ProLiant servers configured with greater than 6 GB of memory that also have Windows 2000 Service Pack 4 (SP4) or Microsoft QFE # Q817566 for Windows 2000 Service Pack 3 (SP3) installed.</p> <p>Any HP ProLiant server with Windows 2000 SP4 or the Hotfix for Windows 2000 SP3, greater than 6 GB of memory, and configured with any of the following controllers:</p> <ul style="list-style-type: none">• SMART-2/P or SMART-2DH Controller• SMART-2SL Array Controller• Smart Array 3200 Controller• Smart Array 3100ES Controller• Smart Array 221 Controller• EISA Smart Array Controller• Integrated Smart Array Controller (HP ProLiant DL580, HP ProLiant DL760, HP ProLiant 8000, HP ProLiant 8500)• RAID LC2 Controller• Smart Array 4200 Controller• Smart Array 4250ES Controller (HP ProLiant ML750)• Smart Array 431 Controller <p>The Fibre Channel Host Bus Adapter (HBA) and the following external storage components are also rendered invisible:</p> <ul style="list-style-type: none">• RAID Array 4000• RAID Array 4100• MSA1000
Solution	<p>In order for Smart Array Controllers and their associated storage devices to be visible in the Array Configuration Utility (ACU) or in Insight Manager 7 and to be able to be configured by the ACU, Microsoft has provided a Hotfix. To obtain the Hotfix, refer to the Microsoft Knowledge Base article 826322, "Disk Array Controller Driver May Not Load After You Upgrade To Windows 2000 SP4," available at the following Microsoft URL:</p> <p>http://support.microsoft.com/?id=826322</p> <p>As a workaround, limit the Windows 2000 addressable memory to 6 GB by setting <code>/maxmem=6000</code> in <code>BOOT.INI</code>.</p>

Issue 2	The HP ProLiant Storage System hardware device (SCSI backplane) needs the HP driver to display in Device Manager	
	Description	The HP ProLiant Storage System device displays correctly if the HP 32-bit SCSI Controller Driver (available on PSP for Windows 2000) is loaded and the system restarted.
	Solution	Use cpq32fs2.sys (the HP 32-bit SCSI Controller driver).
Issue 3	Accessing Custom Configuration during unattended installation	
	Description	Custom Configuration is not directly accessible during the dialog box sequence of a SmartStart unattended installation.
	Solution	To access Custom Configuration, wait until the installation sequence prompts for the domain. Select the Back button to access dialog boxes used to configure the network and the network controller devices.
Issue 4	Multi-monitor Display Configuration ATI Controller requires Slot 1 to function properly	
	Description	When multiple monitors and video controllers are connected to a HP server, the ATI driver cannot locate the video controller if the ATI Rage IIC video controller is not in the first slot.
	Solution	With the ATI Rage IIC as the first video device and a non-ATI video controller as the second device, all video drivers function appropriately. For multiple monitor installations, the ATI video controller should be in slot 1.
Issue 5	HP driver updates after Windows 2000 installation	
	Description	<p>When multiple monitors and video controllers are connected to a HP server, the ATI driver cannot locate the video controller if the ATI Rage IIC video controller is not in the first slot.</p> <p>With the ATI Rage IIC as the first video device and a non-ATI video controller as the second device, all video drivers function appropriately. For multiple monitor installations, the ATI video controller should be in slot 1.</p> <p>When installing a new device, Windows 2000 boots and finds new hardware. The following message box appears:</p> <p>"The following file is missing: xxxx"</p> <p>PSP for Windows 2000 installed drivers for the device from a temporary directory. Windows uses that temporary directory rather than using the path to the existing driver.</p>
	Solution	<p>To complete the device addition, close the message box and manually perform the individual driver installation using PSP. Deselect all other drivers, and then select Install for the remaining selected driver.</p> <p>Disregard the driver install log that reports the driver as up to date. Running the installation will update the driver for the new device(s) added.</p>
Issue 6	When Rescan Disks is selected after hot-plugging a hard drive, Windows 2000 might inappropriately display an Unsafe Removal of Device prompt	
	Description	After hot plugging a hard drive in a storage drive bay, selecting Rescan Disks might result in Windows 2000 failing to identify the drive and displaying this error message:
	Solution	"Unsafe Removal of Device: You have unplugged or ejected a device without stopping it. Unplugging or ejecting a device without first stopping them can often cause the computer to crash or lose valuable data. To safely unplug or eject any of the following devices, first use the Hardware Wizard in the Control Panel to stop the device..."

Issue 7	Anomalies associated with adding EISA/ISA bus options	
	Description	After hot plugging a hard drive in a storage drive bay, selecting Rescan Disks might result in Windows 2000 failing to identify the drive and displaying this error message:
	Solution	"Unsafe Removal of Device: You have unplugged or ejected a device without stopping it. Unplugging or ejecting a device without first stopping them can often cause the computer to crash or lose valuable data. To safely unplug or eject any of the following devices, first use the Hardware Wizard in the Control Panel to stop the device..."
Issue 8	Windows 2000 does not detect changes to the IRQ of EISA devices	
	Description	Windows 2000 does not detect changes to the IRQ of EISA devices.
	Solution	<p>Changing the interrupt associated with the SMART 2/E Array Controller as the booting device is not supported.</p> <p>Please check the resource settings in system configuration before exchanging a faulty controller. On the new SMART 2/E Array Controller, all resources must be set the same as they were on the SMART 2/E Array Controller being replaced.</p> <p>The SMART 2/E Array Controller is an Extended Industry Standard Architecture (EISA) controller and not a Plug and Play (PnP) architecture controller. Windows 2000 uses PnP, which cannot detect and change the resource settings for an EISA controller. Windows 2000 expects to find the SMART 2/E Array Controller at the memory address and Interrupt Request (IRQ) number specified when the original SMART 2/E Array controller was installed.</p>
Issue 9	Some HP server USB hardware displays as unsupported USB connector in Device Manager	
	Description	Some HP server USB hardware displays as unsupported USB connector in Device Manager.
	Solution	Some HP servers display a yellow exclamation mark in the Windows 2000 Device Manager. This is expected behavior. These HP servers were not designed to implement the USB functionality and no problem actually exists.
Issue 10	CPQARRAY.SYS and CPQARRAY2.SYS cause timeout error messages in the event log at startup	
	Description	CPQARRAY.SYS and CPQARRAY2.SYS cause timeout error messages in the event log at startup.
	Solution	<p>At startup, CPQARRAY.SYS and CPQARRAY2.SYS cause timeout error messages in the event log. A message may be displayed in the event log that reads:</p> <p>CPQARRAY2 - device\SCSI\CPQARRAY21 is not ready for access.</p> <p>or</p> <p>The device, \Device\Scsi\Cpqarray2, did not respond within the timeout period.</p> <p>These messages may safely be ignored (loading the drivers and initializing all attached devices takes more time than Windows 2000 expects). Despite the timeout messages, the drivers do install and the controllers function correctly.</p>

Issue 11	Using the F6 key to install HP drivers	
	Description	<p>Press the F6 key to interrupt the text mode setup and install OEM-supplied drivers at the prompt:</p> <p>Press F6 to install a third-party SCSI or RAID driver.</p> <p>However, HP drivers loaded through this procedure will be replaced with the drivers on the Windows 2000 CD during installation.</p>
	Solution	<p>Unless otherwise instructed, continue using the driver versions on the Windows 2000 CD during the setup process, then upgrade to the latest HP drivers supplied on PSP for Windows 2000. The manufacturer should address third-party hardware drivers and their installation.</p>
Issue 12	Special installation procedures for HP storage drivers	
	Description	<p>After the system has been rebooted following the initial installation of the PSP for Windows 2000, event notification drivers for storage devices are installed by performing a second PSP installation.</p>
	Solution	<p>Check the hardware documentation to determine which driver is required for operation of the controller.</p> <p>The HP ProLiant Storage System Plug and Play device (for SCSI event reporting), the Drive Array Event Notification device (for array event reporting), and the HP Smart Array 5x Notification device are not visible under Device Manager until all HP SCSI and RAID (miniport) drivers are installed. The first pass installs the HP drivers CPQ32FS2.SYS or ADPU160M.SYS (for SCSI), CPQARRAY.SYS (for older array controllers) or CPQARRAY2.SYS or CPQCISSE.SYS (for newer array controllers).</p> <p>To complete the install, run the PSP a second time, during which the drivers PRLNTSS.SYS, CPQDAEN.SYS, and CPQCISSE.SYS will be properly loaded.</p>

Feature implementation

A few system configurations may require additional user action to complete the installation. Some value-added features are implemented differently under Windows 2000 than they were under Windows NT 4.0

Table 10. Windows 2000 feature implementation issues

Issue 13	COM 3 might display as a not supported device	
	Description	<p>After Windows 2000 is installed on a server with the HP 56K Netelligent ISA internal modem installed, COM 3 might be displayed as an unsupported device in Device Manager. The Device Status message says:</p> <p>This device cannot start. (Code 10)</p>
	Solution	<p>This also shows up as a problem device under the Computer Management snap-in, under System Information Components Problem Devices.</p> <p>The modem functions, when set to Plug and Play Mode, even if Windows 2000 displays COM 3 as unsupported.</p>

Issue 14	Device Manager shows error for the VGA and VGASave devices on a Prosignia 200 Server	
	Description	Under Device Manager Show Hidden Devices, the VGASave device displays with a yellow bang and the VGA device is grayed out. Both show the same message under Device Status on the Properties screen: This device is not present, is not working properly, or does not have all its drivers installed. (Code 24).
	Solution	However, the device functions correctly. HP is working with Microsoft to resolve the erroneous message.
Issue 15	Default video resolution not retained by Windows 2000 after installation	
	Description	After an upgrade to Windows 2000, the default video resolution might not be retained.
	Solution	If the Display Properties screen appears, ensure the settings are correct for the configuration and select Apply. Otherwise, reset the video settings after installing Windows 2000 by right clicking the background and selecting Properties Settings Display Type Detect .
Issue 16	V70 Monitor driver does not install during Windows 2000 installation	
	Description	After installation completes and the system has restarted, the HP V70 monitor can be selected and the driver installed through the Control Panel or the desktop.
	Solution	From the Desktop, right click and select Properties Advanced Monitor Properties. The V70 monitor will install from the Windows 2000 media. HP is working with Microsoft to correct this problem.
Issue 17	Device Manager shows error for the VGA and VGASave devices on a Prosignia 200 Server	
	Description	Hibernation not supported on the Prosignia Server 720 and the HP ProLiant 400 server.
	Solution	Hibernation is not supported for the Prosignia Server 720 or the HP ProLiant 400 server with current ROM revisions.
Issue 18	Hot plug status indicator not updated	
	Description	Hot plug status indicator not updated when fiber optic cable is removed.
	Solution	In Windows NT 4.0, the PCI Hot Plug status indicator (not the power indicator) updates when the fiber optic cable is removed from a controller. However, in Windows 2000, the HP Remote Console Monitor service does not include this feature and the status indicator does not update.
Issue 19	Adding an EISA channel controller	
	Description	Windows 2000 loads specific drivers to the operating system when it discovers ACPI-capable servers during installation. However, it does not install the proper settings of ACPI if they are not discovered at installation.
	Solution	Changing ACPI settings after installation requires reinstalling the operating system.

Issue 20	Adding an EISA fibre channel controller
Description	With the server shut down and power removed from the server, install the EISA fibre channel controller in the server by following the procedures detailed below in the "Solution."
Solution	<p>To install the controller:</p> <ol style="list-style-type: none"> 1. Run the System Configuration Utility to add the controller and configure changes to system BIOS. 2. Restart the server. 3. Start the hardware wizard by right clicking on My Computer Properties Hardware. 4. Select Add/Troubleshoot a Device. No devices will be found. 5. Select Add New Device from the Choose Hardware Device screen. 6. Select No, I want to select hardware from a list. 7. Select SCSI and RAID Controllers. 8. Select HP and HP Fibre Channel Host Controller (non PnP). 9. Click Next Finish. 10. Restart the server. <p>To load the driver:</p> <p>After the restart completes, the Found New Hardware wizard will display.</p> <p>This process resolves the device listed as Unknown Device under the Device Manager tree. This Unknown Device, the HP Fibre Channel Controller /E, requires the CPQFCALM.SYS driver.</p>
<p>NOTE</p> <p>The device HP Fibre Channel Host Controller (non PnP), displayed under Device Manager with a yellow exclamation point, can now be removed from the Device Manager tree.</p>	

Ensure that the latest version of CPQFCALM.SYS is readily available.

1. Select **Next | Display**.

IMPORTANT

Do not select Search for a suitable driver for my device. Using this method will result in the OS not allowing the user to load CPQFCALM.SYS for the Fibre Channel controller.

2. Select **SCSI and RAID Controllers | Have Disk**.
3. Browse to the latest HP version of CPQFCALM.INF and double-click the file.
4. Select **HP StorageWorks Fibre Channel Host Bus Controller/E**, and click **Next**.
5. Browse to the latest HP version of CPQFCALM.SYS and select the file.
6. Click **Next**.

Click **Yes** at the Digital Signature Not Found screen, and click **Finish**.

Conclusion

In this integration note detailed information has been provided on installing, implementing, and troubleshooting Windows 2000 Server with SP4 and Windows 2000 Advanced Server with SP4 on HP ProLiant servers.

Appendix a HP ProLiant server features

Table 11. HP ProLiant server features

Servers	ROM Setup	RBSU	iLO	Online Spare Memory	Hot-Plug Mirrored Memory	WOL	PXE
Prosignia 720	✓						
HP ProLiant BL10e		✓					✓
HP ProLiant BL10e G2		✓					✓
HP ProLiant BL20p		✓	✓			✓	✓
HP ProLiant BL20p G2		✓	✓			✓	✓
HP ProLiant BL40p		✓	✓				
HP ProLiant DL320		✓				✓	✓
HP ProLiant DL320 G2		✓				✓	✓
HP ProLiant DL360 G2			✓			✓	✓
HP ProLiant DL360 G3			✓				
HP ProLiant DL380 G2		✓	✓	✓		✓	✓
HP ProLiant DL380 G3		✓	✓	✓		✓	✓
HP ProLiant DL560		✓	✓	✓		✓	✓
HP ProLiant DL580 G2		✓	✓	✓	✓		✓
HP ProLiant DL740			✓		✓		
HP ProLiant DL760		✓					
HP ProLiant DL760 G2		✓					
HP ProLiant ML310							
HP ProLiant ML330						✓	
HP ProLiant ML330 G2		✓					✓
HP ProLiant ML330 G3							
HP ProLiant ML350 G2		✓				✓	✓
HP ProLiant ML370 G3		✓	✓	✓		✓	✓
HP ProLiant ML530 G2				✓	✓	✓	
HP ProLiant ML570 G2		✓					

For more information

Resource	Web address
HP Support Page for Windows Server 2000	http://h18004.www1.hp.com/products/servers/software/microsoft/OS/Windows2000_index.html
HP ProLiant Server Support Matrix	http://h10018.www1.hp.com/wwsolutions/windows/index-all.html
Global Limited Warranty for HP ProLiant and X86 Servers and Options	http://h18004.www1.hp.com/products/servers/platforms/warranty/
Microsoft Windows 2000 Support Site	http://technet.microsoft.com/en-us/windowsserver/2000/default.aspx
Microsoft Product Support Lifecycle	http://support.microsoft.com/gp/lifepolicy

Call to action

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